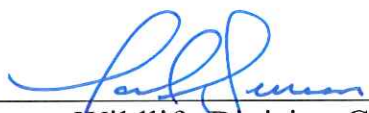


August A. Busch, Jr. Memorial Wetlands at Four Rivers Conservation Area

Ten-Year Area Management Plan
FY 2017-2026



Wildlife Division Chief

28 June 2016

Date

**August A. Busch, Jr. Memorial Wetlands at Four Rivers Conservation Area
Plan Approval Page**

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Signature

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WILDLIFE DIVISION

Wildlife Management Chief



Signature

5/31/16

Date

OVERVIEW

- **Official Area Name:** August A. Busch, Jr. Memorial Wetlands at Four Rivers Conservation Area, # 8238
- **Year of Initial Acquisition:** 1982
- **Acreage:** 13,929 acres
- **County:** Bates, Vernon
- **Division with Administrative Responsibility:** Wildlife
- **Division with Maintenance Responsibility:** Wildlife
- **Statements of Purpose:**

A. Strategic Direction

Protect, restore and manage fish, forest and wildlife habitats, particularly wetlands and their associated plants and animals, emphasizing biodiversity and ecosystem integrity, while providing high quality public use opportunities for hunting, fishing and wildlife viewing.

B. Desired Future Condition

The desired future condition of the August A. Busch, Jr. Memorial Wetlands at Four Rivers Conservation Area (Four Rivers CA) is a complex of intensively and opportunistically managed wetlands with functioning stream-floodplain connectivity; additionally, wet bottomland prairie, wet-mesic bottomland woodland, wet bottomland forest, marsh, swamp and shrub swamp natural communities, along with old fields and crop fields interspersed will provide diverse habitats for a suite of game and non-game species.

C. Federal Aid Statement

- Four Rivers CA, or a portion thereof, was acquired with Pittman-Robertson Wildlife Restoration funds to restore and manage wildlife, conserve and restore suitable wildlife habitat and provide public access for hunting or other wildlife-oriented recreation.
- Four Rivers CA, or a portion thereof, was acquired and developed with North American Wetlands Conservation Act (NAWCA) funds to conserve and restore wetland habitats.
- Four Rivers CA, or a portion thereof, was developed with Wetland Reserve Program funds to provide wetland habitat through a 30 year easement on 7,036 acres and expires in 2028. (Units 3 and 4)

GENERAL INFORMATION AND CONDITIONS

I. Special Considerations

- A. **Priority Areas:** Marmaton River Complex Terrestrial Conservation Opportunity Area, Hightower Creek Aquatic Conservation Opportunity Area, Priority Forest Landscape
- B. **Natural Areas:** Horton Bottoms Natural Area (1,339 acres)
Horton Bottoms Natural Area features one of the largest remnant wetland complexes left in the Osage Plains Section, including extensive bottomland forests and woodlands punctuated by shrub swamps and marsh and wet bottomland prairie openings.

II. Important Natural Features and Resources

- A. **Species of Conservation Concern:** Species of conservation concern are known from this area. Area Managers should consult the Natural Heritage Database annually and review all management activities with the Natural History Biologist.
- B. **Caves:** None
- C. **Springs:** None
- D. **Other:** The area lies in the Osage Plains Section, Cherokee Plains Subsection. The Landtype Association (LTA) is Four Rivers Alluvial Plains. This LTA consists of flat alluvial plains and terraces with little elevation change. Deep, finely textured alluvium forms poorly drained soils. Historically, bottomland prairie, marshes and bottomland forests dominated the area (Nigh & Schroeder, 2002).

III. Existing Infrastructure

- Unit 1:
 - Headquarters Building: Office/Draw Room Building, two storage buildings, shop building, grain bin, August A. Busch, Jr. monument
 - Two privies (Americans with Disabilities Act [ADA] accessible): one at Headquarters building, one at Marmaton Boat Ramp
 - Reservoir (142 acres)
 - Gravel boat ramp with pump-back pad
 - Marmaton River concrete pump ramp/boat ramp
 - Six wetland pools, 12 associated water-control structures, levees and roads
 - Ten parking lots
- Unit 2:
 - Storage building
 - One privy
 - Three-phase electric pump station on Bates County Drainage Ditch
 - Nine wetland pools, 16 associated water-control structures, levees and roads

- Waterfowl hunting blind (ADA-accessible)
- Eight parking lots
- Designated campsite (mowed and graveled, on-site privies, no fire rings, no tables, primitive)
- Unit 3:
 - Robbie Briscoe Memorial Boardwalk
 - Three wetland pools, four associated water-control structures, levees and road
 - Lake (20 acres), water-control structure
 - Gravel boat ramp
 - Ducks Unlimited Presidents' Marsh monument
 - Three parking lots (one ADA-accessible pad at boardwalk)
- Unit 4:
 - Six wetland pools and eight associated water-control structures, levees and roads
 - Four parking lots

IV. Area Restrictions or Limitations

A. Deed Restrictions or Ownership Considerations:

- Unit 1: Private wetland and forest inholding, south of reservoir
- Unit 1: Private forested inholding along Little Osage River
- Unit 1: Road and private forested inholding, south of Pool 1
- Unit 2: Two private landowner inholdings on north side, along Marmaton River
- Unit 2: Goose Lake pump station (Osage Valley Coop power cable)
- Unit 3: No hunting or fishing (previous owners retained rights) (Timber Hill River Bend, Inc.)
- Unit 3: Two small private inholdings in southeast corner (Conway Farms, LLC)
- Unit 4: Private land inholding with ingress/egress easement (Cressup Lake Duck Club)
- Unit 4: Private land inholding with ingress/egress easement (Scotten/Moore)
- Unit 4: Landlocked property beyond Avery road
- Unit 3 and Unit 4: Management on the Wetland Reserve Program easement must follow a Memorandum of Understanding

B. Federal Interest:

- Uses of land acquired with federal funds may not interfere with the purpose for which it was acquired. Federal funds may also be used in the management of this land. Fish and wildlife agencies may not allow recreational activities and related facilities that would interfere with the purpose for which the State is managing the land. Other uses may be acceptable and must be assessed in each specific situation.

- This land must be used to conserve and restore wetlands. The federal funds made available under NAWCA may not be used for fish and wildlife mitigation purposes under the Fish and Wildlife Coordination Act or the Water Resources Development Act of 1986. Federal funds may also be used in the management of this land. Fish and wildlife agencies may not allow recreational activities and related facilities that would interfere with the purpose for which the State is managing the land. Other uses may be acceptable and must be assessed in each specific situation.
- The wetland conservation easements prohibit use of the affected land as cropland and require maintenance of the wetland conditions for the life of the agreement, except in the case of natural disaster. Federal funds may also be used in the management of this land. Fish and wildlife agencies may not allow recreational activities and related facilities that would interfere with the purpose for which the State is managing the land. Other uses may be acceptable and must be assessed in each specific situation.

C. Easements:

- Harry S. Truman Dam and Reservoir flowage easement (742 mean sea level and below)
- Wetland Reserve Program 30-year easement (April 24, 1998 – April 23, 2028) with U. S. Department of Agriculture, Natural Resources Conservation Service
- Unit 4: Private land inholding and ingress/egress easement (Cressup Lake Duck Club)
- Unit 4: Private land inholding and ingress/egress easement (Scotten/Moore Family)

D. Cultural Resources Findings: Yes, records kept with Missouri Department of Conservation (Department) Environmental Compliance Specialist. Managers should follow Best Management Practices for Cultural Resources found in the Department Resource Policy Manual.

E. Endangered Species: None observed.

F. Boundary Issues: Establishing accurate and identifiable boundary markers is a priority for this property.

MANAGEMENT CONSIDERATIONS

V. Terrestrial Resource Management Considerations

Manage floodplain habitats and restore additional habitat that supports a diversity of game and non-game species for the benefit of public use, where possible.

Challenges and Opportunities:

- 1) High quality waterfowl habitat and adequate waterfowl refuge is needed to support abundant waterfowl populations during spring and fall migrations.
- 2) Wetland pools developed in Units 3 and 4 provide a large wetland complex and habitat for a broad suite of wetland-dependent species throughout the year.
- 3) The area contains some of the best examples of wetlands occurring in the Upper Osage Basin. Alterations, such as stream channelization and upstream and downstream impoundments have affected flood frequency, depth, duration and base flows, making wetland management more challenging. Past wetland developments and repairs have partially restored stream-floodplain connectivity. Some infrastructure is inadequate or needs repair.
- 4) The Horton Bottoms Natural Area contains excellent examples of rare natural communities in Missouri. However, pre-settlement hydrology and fire ecology have been altered and exotic and invasive species are present. Access to the natural area is very limited. Maintaining the Natural Area through management is an ongoing challenge.
- 5) There is potential to reconstruct wet bottomland prairie in areas that were previously converted cropland.
- 6) Invasive and exotic species, particularly sericea lespedeza, Reed canary grass, Paspalum, Sesbania and Johnson grass are present on the area.

Management Objective 1: Manage wetland pools at Units 1 and 2 primarily as moist-soil units. Manage food plot crops to provide a high energy food source, particularly for fall migrating waterfowl.

Strategy 1: Manage pools using a variety of moist-soil management techniques, including but not limited to mowing, spraying and disking. Manage water in spring and fall to promote native annual plants that are shallowly flooded and to provide interspersed open-water areas. (Wildlife)

Strategy 2: Plant small and large grain crops, not to exceed 20 percent of the area's total wetland acres. Corn will not be planted in refuge pools. (Wildlife)

Strategy 3: Drill, broadcast or aerial seed small-seed cultivars when flooding significantly damages wetland habitat. Examples of cultivars to plant include, but are not limited to, buckwheat, Japanese millet and proso millet. (Wildlife)

Strategy 4: Continue to provide high quality inviolate refuge in Units 1 and 2 to support large numbers of waterfowl. Refuge pools will serve as resting and foraging areas to help waterfowl build fat reserves and improve body condition. (Wildlife)

Strategy 5: On portions of Units 1 and 2, manage water in late summer and spring to provide areas of shallowly flooded habitat, interspersed with mudflats to serve as forage and loafing areas for dabbling ducks and shorebirds. (Wildlife)

Management Objective 2: Manage Units 3 and 4 to promote diverse wetland communities, including moist-soil interspersed with open water, emergent marsh, shrub swamp and forested wetlands, to provide for a broad range of wetland-dependent species.

Strategy 1: Use a variety of management techniques in the Ducks Unlimited Presidents' Marsh in Unit 3. Strategically timed floodplain connectivity throughout the year will promote moist-soil, emergent marsh and shrub swamp habitat for a broad range of wetland species. (Wildlife)

Strategy 2: Limit floodplain connectivity in Pool 14 in Unit 3 to late fall through winter. Minimize, to the extent possible, the effects of flooding during the growing season to protect the 650-acre bottomland forest planting. (Wildlife)

Strategy 3: Continue to maintain unimpeded river-to-floodplain connectivity through the water-control structure in Unit 4 to promote a range of wetland habitats, particularly moist-soil, shrub swamp and emergent marsh, throughout the year. (Wildlife)

Strategy 4: When flooding significantly damages overall wetland habitat in Units 3 and 4, drill, broadcast or aerial seed small-seed cultivars. Examples of cultivars to plant include, but are not limited to, buckwheat, Japanese millet and proso millet. (Wildlife)

Strategy 5: Hold spring and summer floodwater in borrow areas and across low floodplain areas on portions of Units 3 and 4 to provide habitat for a broad suite of wetland species throughout the year, when consistent with other management objectives. (Wildlife)

Management Objective 3: Improve floodplain function and wetland resiliency.

Strategy 1: Use a stream-floodplain “systems” approach, also known as hydrogeomorphic based evaluation (HGM), including the latest wetland renovation technologies such as LiDAR, and soils and hydrology data as aging or failing infrastructures are replaced, and as funding permits; Conduct renovations in accordance with the *Wetland Planning Initiative Strategic Guidance Document* (Missouri Department of Conservation, 2015). (Wildlife)

Management Objective 4: Manage the Horton Bottoms Natural Area to maintain high quality natural communities.

Strategy 1: Expand access from the county road along I-49 if opportunity allows. (Design and Development)

Strategy 2: Coordinate habitat restoration and maintenance with the Natural History Biologist. (Wildlife)

Strategy 3: Maintain and/or enhance biological diversity and ecological integrity of freshwater marsh, shrub-swamp, wet bottomland prairie, wet-mesic bottomland forest and woodland and wet bottomland forest communities at the natural area, as described in the *The Terrestrial Natural Communities of Missouri* (Nelson 2010). (Wildlife)

Strategy 4: Monitor and maintain “ditch-checks” to trap sediment. (Wildlife and Design and Development)

Strategy 5: Conduct forest inventory. (Forestry)

Management Objective 5: Restore wet bottomland prairie natural communities, where practical.

Strategy 1: Reconstruct wet bottomland prairie using native wet prairie seed on suitable areas that were formerly cropland on high terraces, particularly in Unit 4. (Wildlife)

Management Objective 6: Control invasive or exotic species.

Strategy 1: Monitor invasive or exotic species. Spot-treat, broadcast or aerial spray invasive or exotic species, including but not limited to sericea lespedeza, reed canary grass, Paspalum, Sesbania and Johnson grass. Natural communities, wetlands and restored grasslands are prioritized for treatments. (Wildlife)

VI. Aquatic Resource Management Considerations

Challenges and Opportunities:

- 1) Landscape-scale alterations in the Upper Osage Basin have changed the hydrology and habitat conditions instream and across the floodplain, threatening water quality, streambank stability and biodiversity on the area.
- 2) Missouri Species of Conservation Concern occur in the Marais des Cygnes River.
- 3) Streams ranging in size, from first to seventh order, are present throughout the area.

Management Objective 1: Manage the area's streams and adjacent floodplain for a diversity of aquatic species, consistent with other management objectives.

Strategy 1: At first-order streams, maintain riparian corridors of at least 50 feet in width, per the Department's stream management guidelines (Missouri Department of Conservation, 2009). At second- to fourth-order streams (based on topographic map blue-line streams), maintain corridors of at least 100 feet in width. At sixth-order and larger streams, maintain corridors of at least 300 feet in width. (Wildlife)

Strategy 2: Maintain water in borrow areas on portions of Units 1 and 2 until June 15 of each year, to benefit fish spawning and nurseries, when consistent with wetland management objectives. (Wildlife)

Strategy 3: Hold spring and summer floodwater in borrow areas and across low floodplain areas on portions of Units 3 and 4, to benefit fish spawning and nurseries throughout the year, when consistent with wetland management objectives. (Wildlife)

Strategy 4: As old infrastructure is replaced, design new infrastructure to minimize seasonal mortality of native fish species in developed wetlands. (Wildlife, Design and Development)

Strategy 5: Continue to manage riparian areas for stream bank stability, which will help promote quality in-stream habitats for fish and other aquatic organisms, in accordance with the Department's stream management guidelines (Missouri Department of Conservation, 2009). (Wildlife)

Management Objective 2: Minimize impacts from wetland pumping to instream aquatic resources while balancing the needs of floodplain habitat and associated wetland resources.

Strategy 1: Limit pumping activities at Unit 1 wetlands, as needed, during periods of low flow on the Marmaton River, per the recommendations of an interdisciplinary team as per the *Wetland Plan Strategic Guidance* document (Missouri Department of Conservation, 2015). (Wildlife, Fisheries and Resource Science)

Strategy 2: Decisions regarding pumping activities on the Marais des Cygnes River/Bates County Drainage Ditch for the Unit 2 wetlands will reflect considerations that balance needs of floodplain and instream resources. (Wildlife)

Strategy 3: Replace current Unit 2 pumps with variable-flow pumps to provide flexibility in pumping volume, as funding permits. (Design and Development)

Management Objective 3: Manage fishing ponds, lakes and fishable strip pits.

Strategy 1: Monitor fish communities in fishing basins, as needed. (Fisheries)

Strategy 2: Periodically stock supplemental channel catfish. (Fisheries)

Strategy 3: Monitor and manage vegetation in fishing ponds. (Fisheries)

Strategy 4: Evaluate non-fishing ponds and consider potential as amphibian ponds. (Fisheries)

VII. Public Use Management Considerations

Challenges and Opportunities:

- 1) The waterfowl hunting program on Four Rivers CA provides excellent opportunity on a large scale, while balancing hunter preferences for a range of hunting styles.
- 2) Deer hunting opportunities are extensive on the area. Area user conflicts arise due to access limitations, hunting pressure, differences in preferred hunting methods and road or zone closures.
- 3) River access for public fishing is limited on the area. Fishing resources include three fishable strip pits, a 20-acre lake, a 140-acre reservoir, one boat ramp on the Marmaton River and one identified bank-fishing point.
- 4) Access is somewhat limited on portions of the area. Maintenance of existing parking lots is a priority to provide opportunities for hunting, fishing and nature viewing.
- 5) Work to build positive relationships with stakeholders (such as neighboring landowners, “duck clubs” and in-holding owners) by providing timely assistance if private access or public use issues develop.
- 6) The area’s size, habitat diversity and proximity to highly populated areas provide educational and interpretive opportunities.

Management Objective 1: Provide a range of waterfowl hunting opportunities to meet the needs and preferences of waterfowl hunters.

Strategy 1: Support the continuation of the managed hunt program for the waterfowl-hunting-only pools in Units 1 and 2 under the current One Member Draws system. (Wildlife)

Strategy 2: Determine the appropriate number of hunting positions allocated daily by considering draw pool configurations and arrangements, Waterfowl Hunt Program guidelines (approximately 40 acres per party), and by hunter expectations for a quality hunting experience. (Wildlife)

Strategy 3: Provide at least one ADA-accessible waterfowl hunting blind, when conditions allow. (Wildlife)

Strategy 4: Units 3 and 4 will continue to be managed as “open hunting” to provide opportunistic waterfowl hunting through a self-registration process. (Wildlife)

Management Objective 2: Provide abundant deer hunting opportunities.

Strategy 1: Promote a variety of deer hunting methods to maximize hunting opportunities, consistent with other resource and public use objectives. (Wildlife)

Management Objective 3: Provide stream-based recreational opportunities.

Strategy 1: Maintain concrete pump ramp for seasonal boat access to the Marmaton River at Unit 1. (Wildlife)

Strategy 2: Maintain bank-fishing access point and parking lot in Unit 2 on the Marmaton River. (Wildlife)

Strategy 3: Conduct a boat ramp feasibility study to add one concrete boat ramp to the area, as funding permits. (Design and Development)

Management Objective 4: Provide wildlife viewing overlooks and parking areas that are informative and inviting to the public.

Strategy 1: Keep portions of the overlooks clear of trees for wildlife viewing opportunities. (Wildlife)

Strategy 2: Maintain all current parking lots to be inviting to the public. (Wildlife)

Management Objective 5: Foster positive relationships with neighboring landowners.

Strategy 1: Work with neighbors and inholding owners to prevent or resolve any ingress or egress issues, and boundary or trespass issues. (Wildlife, Private Lands and Protection)

Management Objective 6: Improve educational and interpretive opportunities.

Strategy 1: Taxidermy mounts of water birds in the public meeting room (draw room), as specimens are made available and as funding permits. (Wildlife)

Strategy 2: Renovate the boardwalk in the Robbie Briscoe Memorial Wetland Marsh in Unit 3 to ensure a safe, inviting wildlife viewing opportunity. (Design and Development)

Strategy 3: Maintain signage in accordance with Department policy. (Wildlife)

Strategy 4: Update maps and information on the Department Atlas database to inform the public of area opportunities. (Wildlife)

Strategy 5: Communicate the area's educational programs to teachers and other youth leaders, as opportunities arise. (Outreach and Education)

VIII. Administrative Considerations

Challenges and Opportunities:

- 1) Maintain and clearly demarcate area boundary lines.
- 2) Evaluate land offered as additions to the area, particularly where inholdings exist.

Management Objective 1: Clearly identify area boundaries.

Strategy 1: Submit a boundary survey request for boundary segments that have no fence or delineation and have never been surveyed. (Wildlife)

Lands Proposed for Acquisition:

When available, adjacent land may be considered for acquisition from willing sellers. Tracts that eliminated inholdings, improve area access, provide public use opportunities, contain unique natural communities and/or species of conservation concern, or meet other Department priorities, as identified in the annual Department land acquisition priorities, may be considered.

MANAGEMENT TIMETABLE

Strategies are considered ongoing unless listed in the following table:

[illegible]

APPENDICES

Area Background:

Four Rivers CA is located about 15 miles north of Nevada and 5 miles south of Rich Hill in Bates and Vernon counties. To reach the headquarters from I-49/71 Highway, take Route TT east 2 miles to 1600 Road, then south 2 miles.

The initial purchase of nearly 4,500 acres occurred in 1982. A large-scale development was completed during 1995 and 1996, which included a 140-acre water storage reservoir, and a portable pump and concrete ramp on the Marmaton River in Unit 1. The Unit 2 portion involved adding three-phase electricity and a pump station on the Bates County Drainage Ditch segment of the Marais des Cygnes River. The new infrastructure also included a system of levees and water-control structures, which restored over 2,000 acres of productive, manageable wetlands across 14 separate pools. These units now make up the waterfowl refuge and managed hunt portions of the area. The development created waterfowl hunting opportunities for an ADA-accessible waterfowl hunting blind party and up to 24 parties of wade-and-shoot duck hunters.

In 1998, two tracts totaling 7,036 acres were added to the area through a cooperative partnership between the Department, the Natural Resources Conservation Service, Ducks Unlimited, the North American Wetland Conservation Council and the Busch family. In 1999, the area was renamed the August A. Busch, Jr. Memorial Wetlands at Four Rivers Conservation Area to honor the former Conservation Department Commissioner who cherished wetlands and waterfowl. By 2001, this addition had been developed into two pools (now three) in Unit 3 and six pools in Unit 4, to include over 3,200 total acres of wetlands. These units are considered “open hunting,” which only requires that hunters complete the self-registration process; waterfowl hunting opportunity is unlimited.

The intensively managed units (Units 1 and 2) are primarily managed for waterfowl and shorebirds, using a variety of moist-soil management techniques, along with some agricultural crops. The Wetland Reserve Program units (Units 3 and 4) are managed opportunistically, and contain good examples of wet-bottomland prairie, marsh and shrub-swamp natural communities. These habitats provide for a broad suite of wetland-dependent species including waterfowl, secretive marsh birds, shorebirds, fish and wetland mammals.

Four Rivers CA is nationally recognized as a waterfowl hunting destination. The area provides opportunity for well over 5,000 hunter-use-days during some seasons. Hunters at the area consist of about 75 percent Missouri residents and 25 percent non-residents. The area also attracts numerous birders, fishermen, deer hunters, turkey hunters and dove hunters.

Legal Description: Vernon County: Township 37N, Range 30W, Section 3-9; Township 37N, Range 31W, Section 1-4, 8-12, 15-17, 21, 22, 27, 28. Bates County: Township 38N, Range 30W, Section 18-19.

Current Land and Water Types:

Land/Water Type	Acres	Miles	% of Area
Developed wetlands	5,300		38
Bottomland forest and woodland	3,998		29
Grassland	1,775		13
Undeveloped wetlands	1,200		9
Cropland	850		6
Old fields	525		4
Lakes, ponds and strip pits	205		1
Infrastructure/Other	41		<1
Savanna	35		<1
Total	13,929		100
Stream frontage		21	

Public Input Summary:

The draft Four Rivers Conservation Area Management Plan was available for a public comment period December 1, 2015 - January 31, 2016. The Missouri Department of Conservation received comments from four respondents (Appendix A). The Four Rivers Conservation Area Planning Team carefully reviewed and considered these ideas as they finalized this document. A summary of public input themes, including how they were incorporated or why they were not, can be found below. Rather than respond to each individual comment, comments are grouped into general themes and are addressed collectively.

Prior to writing this area management plan, the Department received public input (the August A. Busch, Jr. Memorial Wetlands at Four Rivers Conservation Area Idea Gathering Stage) from May 1–June 15, 2015. During this “idea gathering stage,” the Department received 43 comments from 39 respondents (see “August A. Busch, Jr. Memorial Wetlands at Four Rivers Conservation Area Idea Gathering Stage Public Input Summary” at <http://on.mo.gov/1XNAeNT>). The area management planning team took comments into consideration as they drafted this 10-year management plan for Four Rivers Conservation Area. Department responses to comments received during the May 1-June 15 idea gathering stage can be found in Appendix B.

Department responses to themes and issues identified through the Four Rivers Conservation Area public comment period (December 1, 2015 – January 31, 2016)

Supports adding a concrete boat ramp to the area. Access to Horton Bottoms and the river is very important.

This plan recommends a study to determine the feasibility of constructing a boat ramp to provide river access located in an area open to the public year-round. Therefore, this plan supports adding a new boat ramp if the study is favorable, and if funding becomes available.

Suggests flooding Pool 14 in Unit 3 to allow for more hunting opportunities.

The Department is committed to managing wetlands that provide quality hunting opportunities which help maintain Missouri's waterfowl hunting heritage. With that in mind, it is important to note that Unit 3 (along with Unit 4) was acquired in part, through the Wetland Reserve Program. This unit was developed to partially restore stream-floodplain connectivity in order to function as a more "natural" system and as such, flooding and droughts are part of a natural cycle. This is typical of most Wetland Reserve Program projects.

Also, pool 14 was developed in part to restore bottomland forest, a declining habitat in Missouri. Dewatering impounded areas during the growing season is critical to ensuring long-term bottomland forest health. This is important to note since water supply in pool 14 is dependent on capturing rain, runoff and floodwater. This plan recommends opportunistic flooding in late fall through winter to provide habitat and waterfowl hunting opportunity when water is available.

Suggests adding a firearms and archery range.

Four Rivers CA is one of a handful of locations around the state that is an approximately 1-hour drive time to the nearest range. The closest unstaffed rifle range is Golden Valley Shooting Range near Clinton and Golden Valley Archery Range is located at the Clinton Missouri Department of Conservation (Department) Office. Currently there are 62 conservation areas across Missouri that provide various unstaffed ranges. Missouri is a national leader in providing free, publicly-owned shooting ranges. Nearly one-third of all such ranges nationwide are located in Missouri and provided by the Department. The Department has worked hard to ensure that there are adequate numbers of ranges statewide.

Additionally, there are a lot of factors that contribute to the selection of an area for a shooting range (e.g. other area uses, topography, resource implications, etc.). Most of Four Rivers CA is relatively flat and located within the U.S. Army Corps of Engineers Truman flowage (flood) easement, so the area can become inaccessible under extreme flood conditions. Also, the area has a managed waterfowl hunting program and provides several million waterfowl-use-days annually. A shooting range would cause unacceptable levels of disturbance to both waterfowl and hunters. For these reasons, there are no plans to add a shooting range at Four Rivers CA.

Concern that Four Rivers' habitat keeps ducks from visiting surrounding private lands.

There are many factors that influence duck numbers and hunter success – waterfowl populations, available habitat and food, migration events, daily temperature, hunting pressure, amount of refuge, and so on. However, evidence generally suggests that more local wetlands leads to more waterfowl and better waterfowl hunting in the area (all other factors being equal). The *Missouri Conservationist* article “Where Are The Ducks?” (January 2006) addresses this topic in depth (<http://on.mo.gov/1T516Jb>).

As an example, there was uncertainty about the impact on duck use and hunter success on Schell-Osage Conservation Area prior to both phases of wetland development on Four Rivers. Roughly fifteen years following the latest Four Rivers developments we can look to historical harvest data for Schell-Osage for evidence. While these numbers don't tell the whole story, the data does suggest that, at the very least, adding wetlands on Four Rivers did not negatively influence Schell-Osage duck use or hunter success. The numbers below compare the “good years” of the late-1970s (prior to Four Rivers) to recent years (post-development):

<u>Year</u>	<u>Ducks</u>	<u>Hunters</u>	
1975	6909	4225	
1976	4530	3554	
1977	5154	3637	
1978	4984	3769	
1979	5214	3605	
Total	26,791	18,790	= 1.42 ducks/hunter
2010	5809	2654	
2011	8609	4458	
2012	8231	4259	
2013	6921	3047	
2014	6122	3610	
Total	35,692	18,028	= 1.98 ducks/hunter

The lack of a national wildlife refuge in west-central Missouri is worthy of note for the sake of comparison. Northwest (Squaw Creek National Wildlife Refuge), central (Swan Lake NWR), and southeast (Mingo NWR) Missouri all contain large wetland complexes managed as waterfowl refuge with limited, or no waterfowl hunting allowed. Yet, adjacent private lands and Department conservation areas enjoy successful hunting. West-central Missouri on the other hand, lacks a national wildlife refuge which contains a large wetland-complex. There are too many variables to draw an exact comparison, but it is reasonable to infer that the Four Rivers wetlands (85 percent of which are heavily hunted) do not provide so much refuge, as to prevent successful hunting on adjacent private lands.

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Maps:

Figure 1: Area Map

Figure 2: Aerial Photograph

Figure 3: Cover Map

Figure 4: LiDAR Topographic Map

Figure 5: Easements Map

Additional Appendices:

Appendix A: Department Responses to Public Comments – Four Rivers Conservation Area Idea Gathering Stage

Appendix B. Four Rivers Conservation Area Management Plan Public Comments

Figure 1: Area Map

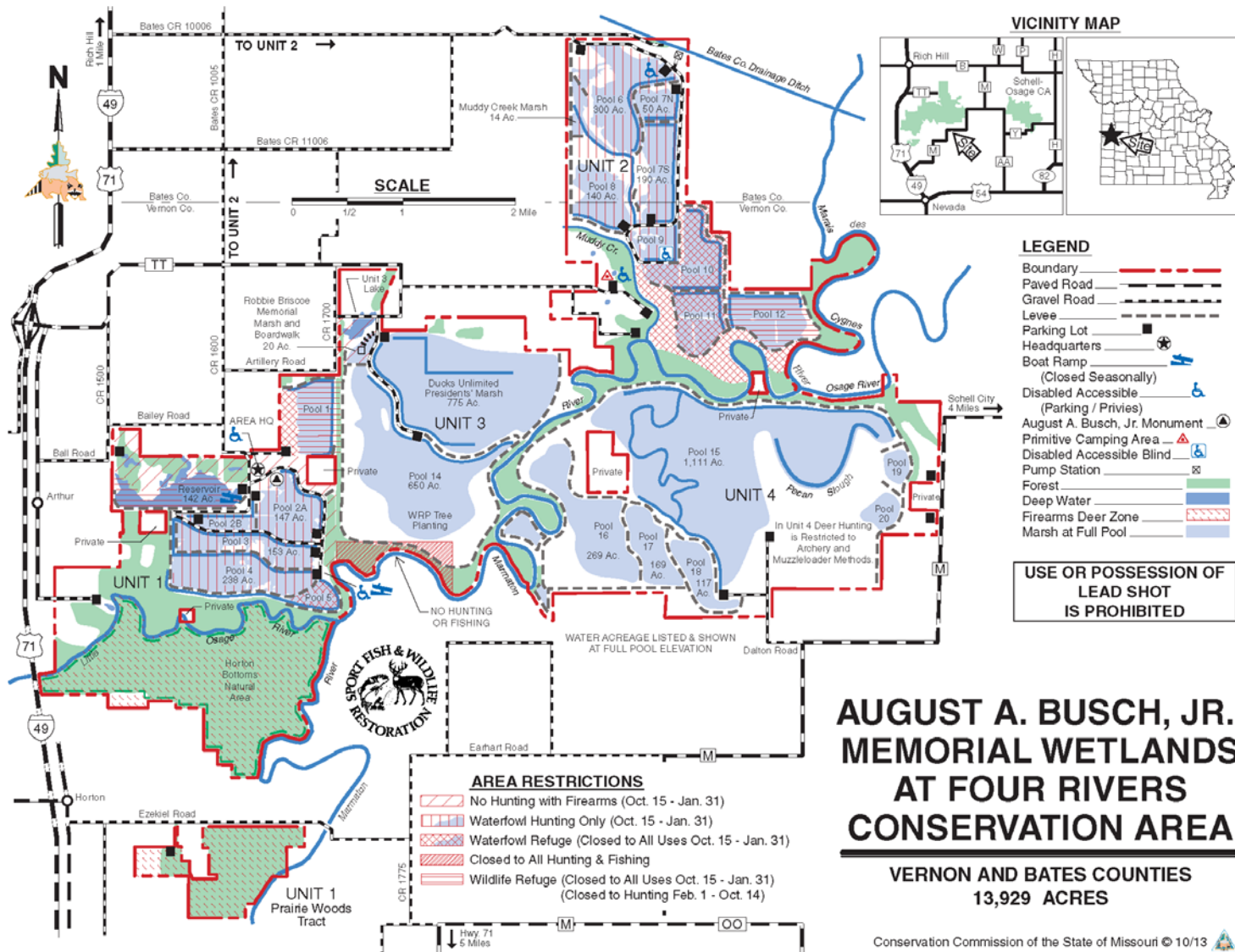


Figure 2: Aerial Photograph

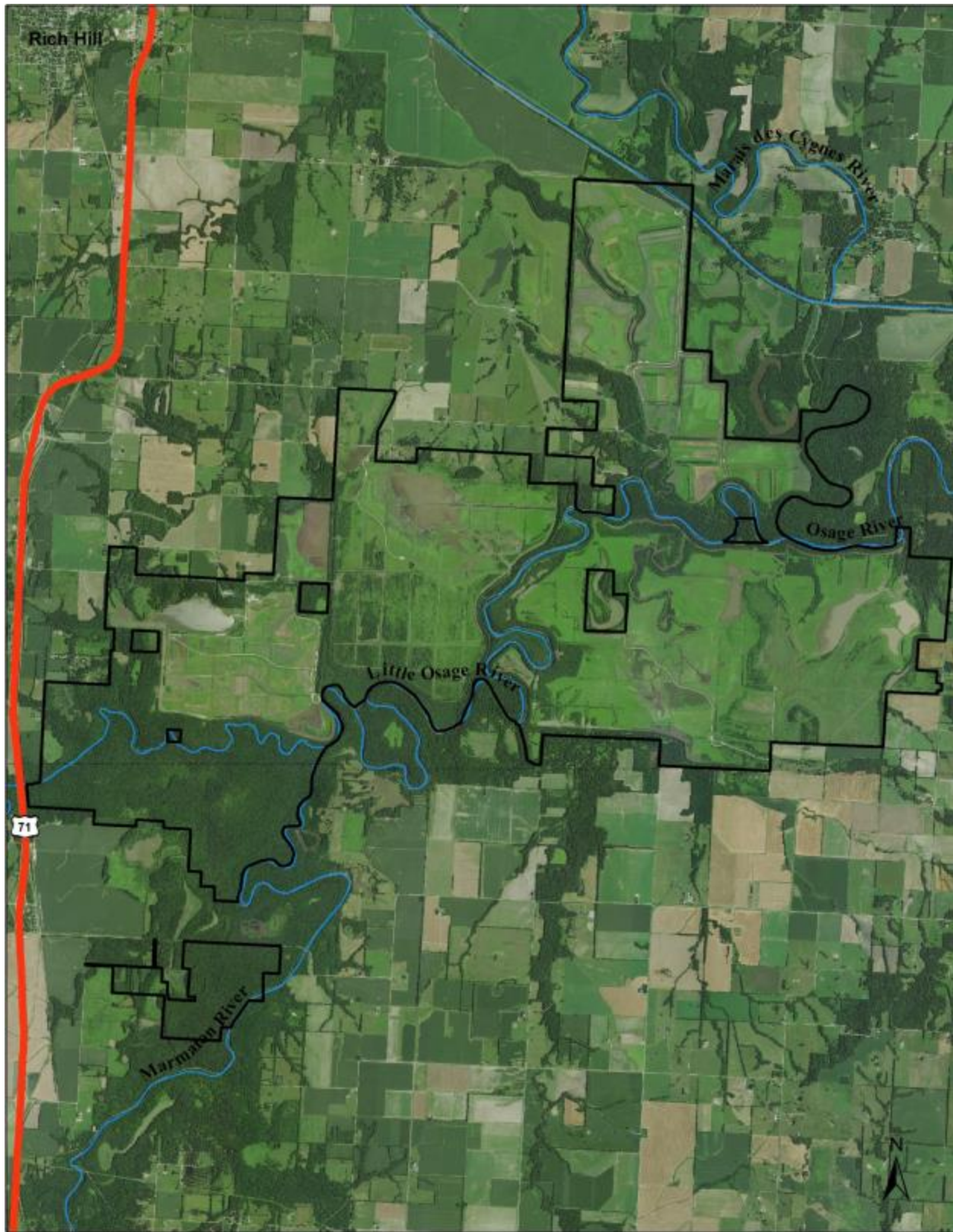


Figure 3: Cover Map

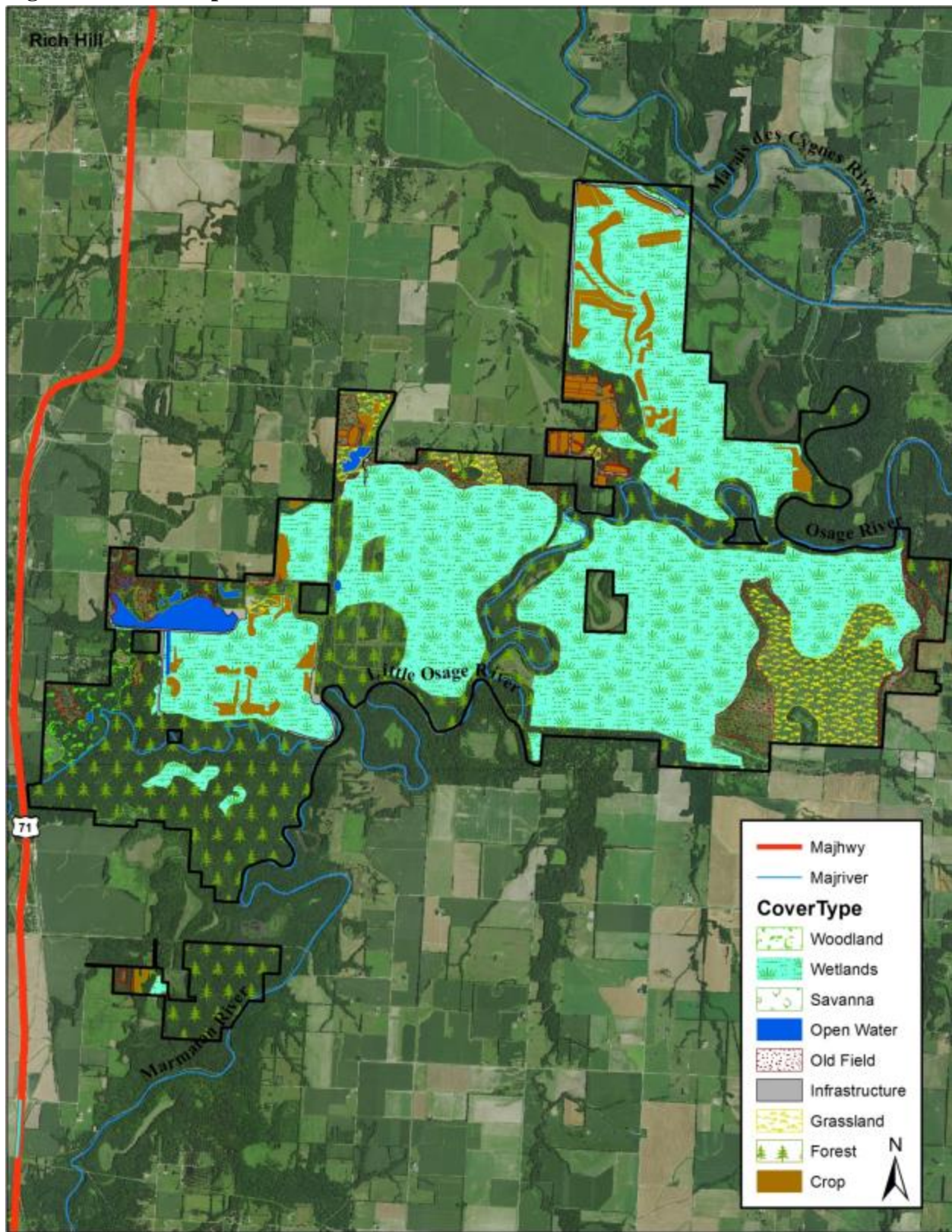


Figure 4: LiDAR Topographic Map (February 2013)

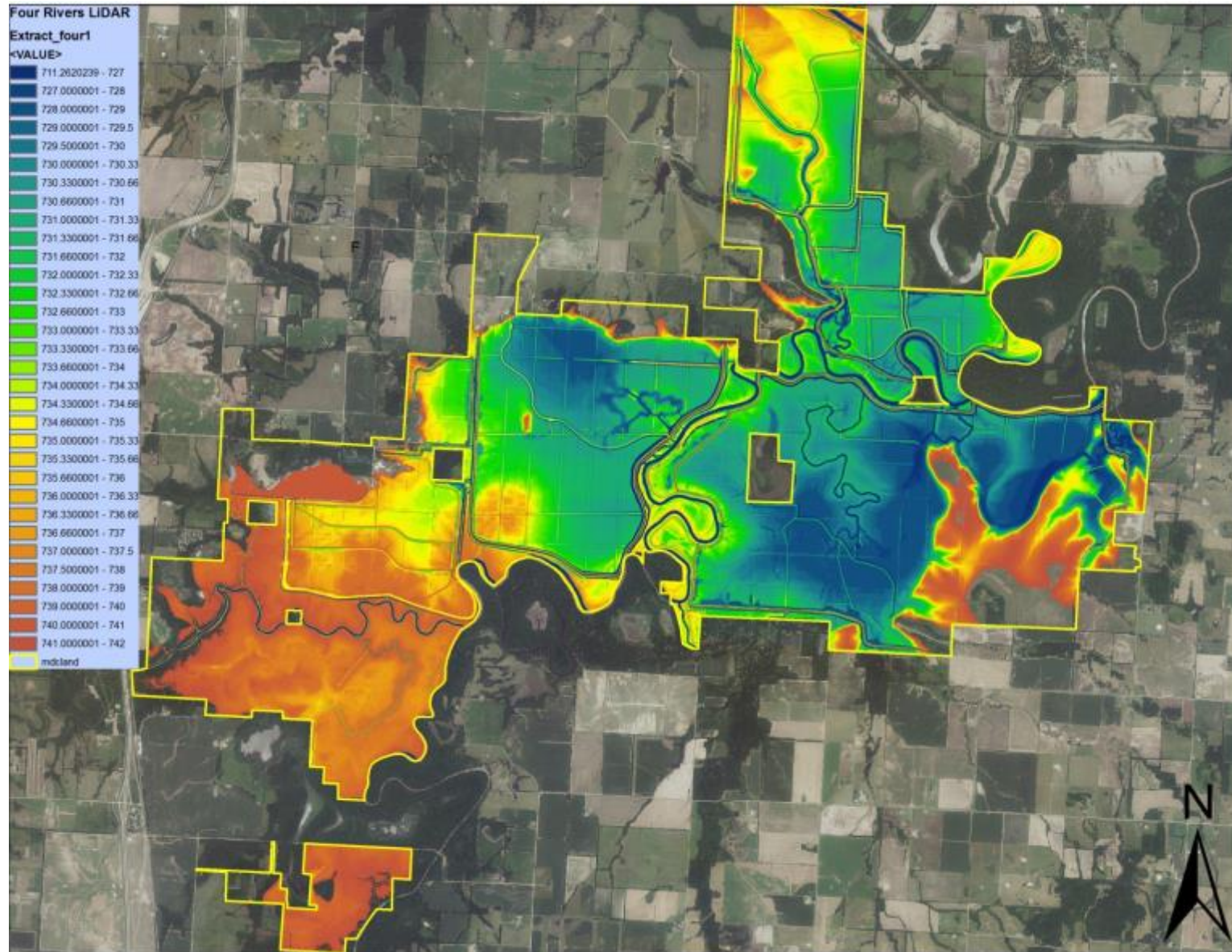
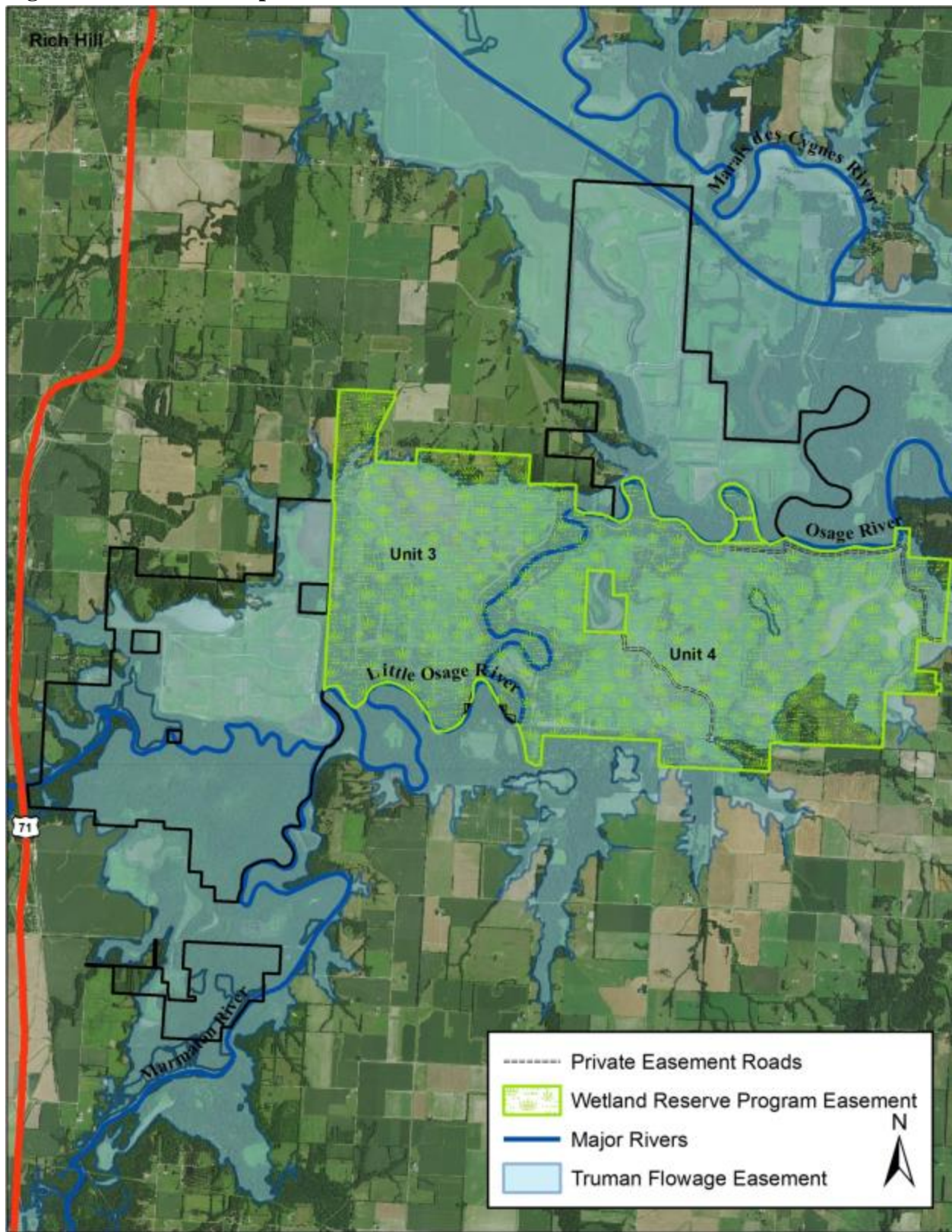


Figure 5: Easements Map



Appendix A. Four Rivers Conservation Area Management Plan Public Comments

Received during public comment period (December 1, 2015 - January 1, 2016):

Management Objective 3 Strategy 3- is very important to me. Access to the river in the form of a ramp.

Access to Horton bottoms is also very important.

The ability to flood pool 14 in unit 3 would allow more hunting opportunities and dense waterfowl habitat. After this year, with the flood, it allowed boating access to pool 14 in the tree planting area. The ducks flocked to the stands of millet plus there was adequate cover for hunter concealment. Being on the Bates ditch, and lack of water regulations would allow this area to be flooded without limitation provided the water was available. Please consider this request.

I would like to see a gun and archery range set up at Four Rivers. The closest one to the area is about 100 miles.

I have owned property west of 4 Rivers since 1985, for the sole purpose of duck hunting. At first I was excited when Four Rivers was to come into play for Waterfowl Reserve. When it was developed first as the East and West units we saw lots of ducks coming out to feed and our hunting was what we expected, in fact some years it exceeded our expectations. Then the purchase and development of the land in between the two units changed the flight of waterfowl going out to feed drastically. My friends, family and co- hunters have had many debates on the subject, and can not decide if it's because there is so much food or that the reserve is just such a big body of water that they just do not leave the reserve like they used to. The private sector is valuable to keeping the tradition of water fowling since most of wetlands are owned and managed by the private sector. This brings up the subject of the season opening too early. I plan on being at the open meeting of the 5 year plan on season zones and the dates that they open.

Thanks

Appendix B: Department Responses to Public Comments – Four Rivers Conservation Area Idea Gathering Stage

Background:

Prior to writing the draft Four Rivers Conservation Area 10-Year Area Management Plan, the Department conducted a public input process May 1-June 15, 2015, as described on page 15. Altogether, 43 comments from 39 respondents were received. The area management planning team took comments into consideration as they drafted the plan. A brief summary of public input themes, including how they were incorporated or why they are not included, can be found below. Comments were grouped into general themes and addressed collectively.

Terrestrial Resource Management

Waterfowl Refuge Management

Suggests limiting crops to no more than 20 percent of reserve (refuge) area. Concerned with crops on refuge area attracting waterfowl and keeping them from migrating to neighboring properties.

Planting traditional row-crops such as corn in the refuge pools on Four Rivers CA has been used as a management tool, on a limited basis. Over the past 10 years no more than 10 percent of the refuge wetland acres have been planted to corn. Staff already began to reduce corn acres in the refuge, and future refuge management will continue to focus primarily on promoting moist-soil, or native, annual vegetation.

Supports current level of waterfowl refuge.

Refuge currently makes up about 15 percent of the wetlands on the area. This is a lower proportion than what has traditionally been the target range (25-50%) for Department wetland areas, but the relatively large scale of wetlands on the area likely offsets this discrepancy. At this time, there are no plans to expand or reduce waterfowl refuge acres on Four Rivers CA.

Wetland Management for Waterfowl and Waterfowl Hunting

Suggests developing a pump system for Units 3 and 4.

There are no specific plans for new pump stations in Unit 3 or 4 at this time. The Department is committed to restoring wetlands and providing quality hunting opportunities to help maintain Missouri's waterfowl hunting heritage. The Golden Anniversary Wetlands Initiative was created in the mid-2000s to renovate the five oldest Department wetland areas as part of this commitment. This initiative will take several more years to complete. Until that time, funding for new wetland-directed capital improvements will be limited.

It should also be noted that Units 3 and 4 were acquired and developed, in part, through the Wetland Reserve Program. These units were developed to restore stream-floodplain connectivity to function as a more “natural” system, which is typical of Wetland Reserve Program projects. Water supply is dependent on capturing rain, runoff and floodwater – flooding and droughts are part of a natural cycle. Regardless, if funding becomes available at a later time, it is possible that a pump station feasibility study would be considered.

Suggests smaller blocks of corn; more milo, millet in hunting areas.

Small blocks of corn are planted in the managed hunting pools on years when conditions permit, but make up no more of 5 percent of the wetland habitat. Generally, these blocks range from 1 to 10 acres. Corn food plots provide a supplemental food source for waterfowl, but are also used as a management tool to setback plant succession and/or control problem plant species.

Additionally, these small blocks provide concealment for waterfowl hunters. When conditions permit, milo and other hybrid sorghum varieties may also be planted in small blocks to provide hunter concealment in areas where vegetation is sparse. See comments about millet seeding below.

Suggests flooding small amount of refuge for early teal season.

Most years, portions of the refuge pools are flooded late in the summer to provide shallow-water habitat for early migrant waterfowl and shorebirds. However, several factors influence early-season (late summer) management decisions. On wet years, when there is plenty of habitat in other areas, flooding refuge pools may be delayed to address management challenges, such as invasive plants. Conversely, on dry years, more water is typically added to the refuge pools (if river conditions permit) to make up for a lack of habitat and hunting opportunity in Units 3 and 4.

Suggests returning to aerial seeding.

Aerial seeding millet is an effective way to mitigate for lost moist-soil habitat (e.g., wild millet, annual smartweed, etc.) following late summer flooding. In the past, up to 25 percent of the wetlands were aerial seeded when this has occurred. This management approach will continue when appropriate.

Supports high quality moist soil habitat as primary method to provide quality habitat for migratory waterfowl. Suggests providing more natural cover in draw areas for blinds.

Suggests providing more food for ducks on area.

The largest portion of the wetlands on Four Rivers CA is managed for native vegetation using a moist-soil management approach. This technique employs timely water manipulation and disturbance to promote native, annual vegetation. These plants provide abundant seeds and promote invertebrates for foraging waterfowl in the spring and fall. The wetlands are typically

managed as 90 percent native, 5 percent row crop (corn, milo, etc.) and 5 percent small-seed food plots (buckwheat, Japanese millet, etc.).

Suggests increased weed control.

Controlling exotic or invasive “weeds” is a high priority every year. Staff spends a great deal of time and resources trying to accomplish this. It is not uncommon for staff to spray and/or mow several thousand acres annually.

Wetland Management for Non-Game Species:

Suggests managing equally for waterfowl and non-game wetland birds. Suggests managing for mudflats in spring for shorebirds. Suggests managing pools of cattails and other marsh vegetation to benefit wetland birds.

In the spring, water levels in most pools are drawn down slowly, which creates mudflats and shallow water habitat. Depending on rain and average daily temperatures, hundreds of acres of mudflats are exposed, that are used by numerous wetland-dependent birds, including shorebirds, wading birds and waterfowl. During the summer/fall migration, dry portions of the pools are disked July through August and shallow flooding begins in early August. Pumps are then shut off to allow for evaporation, transpiration and soil saturation. This again creates mudflats interspersed with shallow water.

A significant emphasis is also placed on providing late spring and summer water on portions of the Wetland Reserve Program units, which mostly benefits non-game wetland species. Typically, a portion of floodwater is retained in the late spring following drawdowns. Depending on the summer, this water provides large-scale emergent marsh habitat annually. It is important to note, however, that wetland plant communities are a product of soils, hydrology and disturbance regime. So, the landscape setting will drive the habitat. Because of the influence of Truman Dam and Reservoir, the flooding frequency, depth and duration limits emergent marsh dominated by cattail, river bulrush and other robust rooted perennials. These species prefer more static water levels with a narrow range of depth. Rather, water smartweed, river sedge and other perennials more tolerant of flooding are more prevalent. To further illustrate the volatility of the Upper Osage floodplain and the influence of Truman Dam and Reservoir, the area experienced 59 floods from 2004-2013. As a result, the few scattered patches of cattails present on Four Rivers CA prior to 2007 mostly died out.

Deer and Turkey Management

Suggests mowing strips in south Unit 3 to promote clover growth.

Staff actively manages fields in the south portion of Unit 3, specifically for deer and turkey, and plans to continue. However, management objectives are not always met due to weather and ground conditions and/or staff, equipment and time limitations.

Supports management that would increase deer and turkey populations on area.

The majority of Four Rivers CA contains abundant natural food resources and quality habitat that supports healthy deer and turkey populations. Additionally, a modest agriculture crop program and staff-planted food plots provide supplemental food sources. It is, however, important to note that some environmental factors (disease, flooding, etc.) may not be controlled through management. So, wildlife populations will vary over time as a result.

Other Habitat Management

Suggests planting native grasslands in upland areas.

Most of the open lands in the uplands have been planted to native grasses and forb mixes over the past 15 years. As a reference, approximately 900 acres of native mixes have been planted, while roughly 150 acres of the uplands are farmed through the agriculture crop program. Significant resources are also dedicated annually to treating invasive species like sericea lespedeza and fescue in the grasslands.

Supports maintaining flood protection levee around Unit 3 to protect bottomland timber.

Protecting and managing the bottomland forest in Pool 14 will continue to be a priority. There are no plans to take down or breach the flood protection levee at this time.

Public Use Management

Waterfowl Hunting

Opposes quick draw method.

There are currently no plans to implement quick draw on Four Rivers CA.

Appreciates current option of open hunting in Units 3 and 4. Suggests allowing open (walk-in) waterfowl hunting in all units. Suggests requiring drawing to limit number of hunters in Units 3 and 4. Suggests closing waterfowl hunting at 1:00 p.m. for first half of season; allow all-day hunting second half of season. Suggests closing waterfowl hunting at 1:00 p.m. for Units 1, 2, 3 and 4. Appreciates all-day waterfowl hunting opportunity. Suggests 11:00 am drawing for afternoon-only hunting. Suggests adding a youth-only waterfowl hunting area on weekends.

The Department's waterfowl hunting program strives to accommodate a diversity of hunting styles and preferences. At Four Rivers CA, the majority of area users prefer either the managed hunt program (morning drawing) in Units 1 and 2 or the open hunting (self-registration system) in Units 3 and 4. The ranges of hunter preferences are fairly evenly split, but a few individual preferences are further illustrated in the eight suggestions provided above. This plan supports maintaining the current system to meet the overwhelming majority's preference for the existing program.

Suggests developing more green timber hunting opportunities.

The majority of Pool 14 was restored to bottomland forest, which will opportunistically provide forested wetland habitat.

Suggests adding/allowing hunting blinds on Unit 1.

The Department's waterfowl hunting program strives to accommodate a diversity of hunting styles and preferences. With that in mind, Four Rivers CA was developed primarily as a wade-in area, which compliments Schell-Osage and Montrose Conservation Areas, which provide primarily blind hunting opportunities.

Suggests greater enforcement of waterfowl hunter boat horsepower limits (especially in Unit 4). Suggests not allowing motorized boats in Unit 4 during waterfowl season.

Area staff and the local Conservation Agents are aware of this problem and take the issue of public safety seriously. Hunters operating boats with outboard motors with 10-plus horsepower are restricted to slow no-wake speeds. This regulation will be enforced. At this time, there are no plans to eliminate the use of outboard motors for waterfowl hunting. However, if public safety continues to be at risk from negligent boat operators, measures may be taken to further restrict outboard motor use on Four Rivers CA.

Suggests allowing hunting in reserve (refuge) area by drawing (every four days and must leave by mid-morning).

Waterfowl hunting will not be allowed in the Waterfowl Refuge during the closed dates. Providing quality undisturbed refuge at the appropriate scale is critical for waterfowl to recover during migration. Research has shown that overall body condition of waterfowl has a significant influence on their reproductive success. Therefore, providing quality refuge not only helps to hold more ducks locally and improves overall hunter success throughout the season, but also has a positive effect on future waterfowl populations. As noted above, current refuge make-up is proportionately lower than what has traditionally been the target range (25-50%) for Department wetland areas.

Suggests increasing out-of-state waterfowl license prices. Opposes use of robotic decoys.

These suggestions are noted, but are not issues that can be addressed through the Area Planning process.

Boat Ramp/Deer Hunting

Suggests opening boat ramp and road to deer hunters when not used for pumping.

Suggests providing a boat ramp that is accessible year round.

The road to the Unit 1 pump station ramp is located in a waterfowl-hunting-only area, which is closed from Oct. 15 to Jan. 31. However, general public access extends to the youth waterfowl season (typically the last weekend in October) and reopens after the middle-zone-duck season closes. This compromise helps to maximize opportunity for river access without causing excessive disturbance to waterfowl and registered waterfowl hunters during managed waterfowl hunting activities.

This plan recommends a boat ramp feasibility study to determine site suitability for a new boat ramp that would be located in an area that is open to the public year-round.

Allow archery deer hunting in waterfowl hunting only areas before and after duck season.

Suggests allowing traditional gear-only (recurve, longbow, selfbow) archery hunting in

Units 1 and 2 from Octo. 15 to Nov. 30. Supports keeping archery-only areas.

Public use management objectives strive to balance resource management with a variety of public use opportunities while minimizing potential user-conflicts. Current area regulations promote a broad range of deer hunting opportunities by allowing multiple methods. There are no plans to change deer hunting regulations on the area at this time.

Trails

Suggests adding a trail system for hikers, bikers and anglers.

Although there is not a designated trail system, there is an extensive network of low-profile levees and field roads that are closed to public vehicular traffic. Most of these are mowed multiple times each year and many wildlife viewers and hikers find these to be acceptable alternatives to an actual trail system. Also, note that the majority of Four Rivers CA lies within the H. S. Truman Reservoir flowage easement and most of the area floods annually. For this reason, it is impractical to maintain a trail system year-round.

Roads

Concern with visitors not observing speed limits on area roads.

Local Conservation Agents have been made aware of this concern and will handle observed infractions accordingly.

Administrative Considerations

Appreciates Four Rivers Conservation Area and local staff.

The Four Rivers CA is truly a unique area with its large-scale wetland complex, bottomland forests, and abundant hunting, fishing and wildlife viewing opportunities. The staff at Four Rivers takes great pride in managing these high quality natural resources and providing reliable customer service for the public that uses them. Staff appreciates the kind words.

Provide access to Horton Bottoms Natural Area. Suggests building a boat ramp east of I-49 service road on Little Osage River to provide access to Horton Bottoms.

The location being referenced is not owned by the Department. However, this plan recommends a boat ramp feasibility study to determine site suitability for a new boat ramp that would be located in an area that is open to the public year-round.

Suggests adding more drop boxes for self-check waterfowl hunting cards.

There is currently one drop box at the headquarters for the draw pools in Units 1 and 2. There have been requests for a Unit 2 drop box, but, because the area is all-day hunting, some hunters don't get out of pools until well after dark. Evening staff perform numerous duties at the headquarters while checking out hunters, which is a more efficient use of staff time.

The other two self-registration boxes are located at the main entrance points in Units 3 and 4. The majority of hunters must drive past these boxes

Suggests Area Manager meet with local landowners once a year to help develop landowner management plans.

Please feel free to contact the Area Manager for technical advice and assistance developing annual management plans.